



**Technical manual**

**Version 01/10**

**FD-PAC**

**Controlkit, R410A**

**(FDC71-250V/FD-PAC)**



**Read this user manual carefully before installation and operation of this equipment.**

**Store this manual together with the other user and technical manuals of the Airconditioning equipment!**



**All mentioned measures and safety instructions must be strictly complied with.**

**The outdoor unit and connected equipment does contain refrigerant R410a.**

## **Safety instructions**

### **General Information, Risks in Non-Compliance with the Safety Instructions**

The instructions contain basic notes to be followed during installation and operation. It therefore must be read by the installation staff and personnel in charge before installation and initial operation. Wrong and improper installation can result in fatal accidents or damage to the system! No liability is born if via the circuit board contacts other devices/components are activated as additional circuit boards! Non-compliance with the safety instructions poses a risk to the personnel, environment and this system. Failure to comply with the safety instructions will result in the loss of any claims.

### **Working with refrigerant**

When working with refrigerant the following conditions must be complied:

- Inhaling big amounts of refrigerant will have a anesthetic effect;
- Refrigerant in gas form is heavier the air and can collect at lower levels. This can create choking hazard;
- Always works with glasses and handgloves during handling refrigerant;
- Do not eat, drink and smoke when handling refrigerant;
- Refrigerant can cause injury when contacting human skin;
- Refrigerant must be handled in ventilated areas only;
- In case of accidents first help must be warned.

### **Qualified Personnel, Training and Safety-Oriented Working**

The personnel in charge with the installation and operation must be properly qualified for these works. Defects due to improper installation can cause electric power accidents or fires! The safety instructions mentioned in the installation guidelines, the applicable national laws regarding accident prevention and internal work, operational and safety instructions must be noted and strictly followed without exception.

### **Safety Instructions on Maintenance, Inspection and Installation Works**

The operator must ensure that all maintenance, inspection and installation works are carried out by authorised and qualified expert personnel that have been thoroughly informed by studying the installation guidelines. Any works on the system must be performed in idle state. The instructions described in the operating manual on idling the system must be absolutely complied with. The machine/system must be made currentless for any works and secured with a warning sign against unintentional switching on. The machine and/or system must be checked if it is free from current. Before taking it back into operation the measures outlined under "Assembly/Operation" must be noted and followed. Any electric works must be carried out by qualified expert personnel complying with all safety regulations on electric equipment, applicable local regulations and installation guidelines. Only divided circuits may be used. Improper electric connections can cause serious accidents and fires.

The electric connections must always be made with suitable cables, and it must be ensured that the cables are properly secured to prevent any mechanical forces on the cables from affecting the cable connections inside the machine. A faulty cable connection can develop heat inside the machine and/or cause fires. It must be ensured that electric lines cannot be damaged by lids/maintenance covers. A faulty installation of the maintenance cover can also develop heat inside the machine and/or cause fires.

**Impermissible Operation**

Safe operation of the system is only ensured if it is used in accordance with regulations and instructions. The limit values given in the technical specification must never be exceeded.

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## 1. Descripton FD-PAC / Warranty exclusion

Control kit for connecting an optional heat exchanger on a FDC outdoor unit for cooling and heating (refrigerant R410A).The control kit is fully wired and contain the electronics with microprocessor for communication with the FDC outdoor unit. The selfdiagnose system provides a fast recognition of problems and provides alpha numeric codes on the remote controller. Via DIP switches the PCB needs to be configured in relation with the optional equipment. The temperature sensors are included in this delivery.

The equipment will be controlled via a remote controller with actual time and timer functions, ventilation selections and operation/warning connections (CNT contact).

The control kit can be switched on/off via an external 230V AC signal. Via optional PCB's the control kit can be combined in a central controller.

**Caution: The manufacturer is obliged to give warranty on the delivered components and therefor not responsible for the operation and control of the equipment which is connected to the control kit FD-PAC!**

**Furthermore there is no warranty or a possibility to claim ensuing damage which is the result of wrong calculation, selection of heat exchangers, positioning of sensors, planning and installation mistakes.**

**When using the control kit in combination with cold water equipment via plate heat exchangers there must be a minimum of 15% glycol in the system. For other constructions or applications a minimum of 15% glycol is recommended.**

The pictures below can differ from actual delivery.



Control kit  
FD-PAC



Optional remote controller  
RC-E3 (not included)

**Technical specifications and maximum values are mentioned on the next pages.**

## 2. Technical specifications

### Model FD-PAC / FDC71VN

Technical specifications		Model	Control kit		Outdoor unit
			FD-PAC		FDC71VN
<b>Nominal cooling capacity (1)</b>		W	7100 (3200 ~ 8000)		
<b>Nominal heating capacity (1)</b>		W	8000 (3600 ~ 9000)		
<b>Power source</b>			1 fase, 220/230/240V, 50Hz, N, PE		
<b>Operation data (3)</b>	Cooling power consumption	kW	2,01/2,01		
	Running current (cooling)	A	8,9/9,2		
	Power factor (cooling)	%	98/99		
	Heating power consumption	kW	2,21/2,21		
	Running current (heating)	A	9,8/10,2		
	Power factor (heating)	%	99		
	Inrush current	A	5,0		
	Moise level	dB(A)	-	-	48
<b>Exterior dimensions (height x width x depth)</b>		mm	400 x 300 x 120		750 x 968 x 340
<b>Nett weight</b>		Kg	8		60
<b>Compressor type</b>			-		-
Compressor motor		kW	-		-
<b>Refrigerant oil</b>		L	-		(M-MA32R)
Carterheating		W	-		33 (carterheating)
Starting method			-		Direct
<b>Heat exchanger</b>			-		Air (straight fin)
Defrost control			Microprocessor controller de-icer		
<b>Refrigerant</b>			R410A		
<b>Refrigerant amount</b>		kg	-	-	2,95 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve		
<b>Air handling equipment, fan type</b>			-	-	Axial fan x 1
Motor			-	-	55 x 1
<b>Air flow</b>		m³/h	Min. 1200		3600
<b>Air entrance temperature cooling min./ max.</b>		°C	16 / 32		-
<b>Air entrance temperature heating min./ max.</b>		°C	10 / 32		-
<b>Water entrance temperature cooling min./ max.</b>		°C	16 / 32		-
<b>Water entrance temperature heating min./ max.</b>		°C	10 / 32		-
<b>Safety equipment</b>			-	-	Internal thermostat for fanmotor, anomalous discharge temperature protection
<b>Refrigerant piping</b>		mm	Liquid line 10mm, Gas line 16mm		
Piping size		mm	Liquid line 9,52 mm (3/8"), Gas line 15,88mm (5/8")		
Connecting method			Flare piping		
Isolation			Necessary (liquid and gasline)		
<b>Drain hose</b>		mm	-	-	Drain pan 3x Ø20 mm
<b>Accessoires</b>			-		
Panel (separate packing)			-		
<b>Optional accessoires</b>			-	-	-
Remote controller			RC-E3		-

#### Notes

(1) The data are measured at the following conditions.

Item	Indoor temperature		Outdoor temperature		standard
	d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).

## Model FD-PAC / FDC100VS

Technical specifications		Model	Control kit	Outdoor unit
			FD-PAC	FDC100VS
<b>Nominal cooling capacity (1)</b>			10000 (6100 ~ 11200)	
<b>Nominal heating capacity (1)</b>			11200 (5600 ~ 12500)	
<b>Power source</b>			1 fase, 220/230/240V, 50Hz, N, PE	
<b>Operation data (3)</b>	Cooling power consumption		2,85/2,85	
	Running current (cooling)		12,5/13,1	
	Power factor (cooling)		99/99	
	Heating power consumption		2,97/2,97	
	Running current (heating)		13,0/13,6	
	Power factor (heating)		99/99	
	Inrush current		5,0	
Moise level			-	50
<b>Exterior dimensions (height x width x depth)</b>			400 x 300 x 120	845 x 970 x 370
<b>Nett weight</b>			8	74
<b>Compressor type</b>			-	RM-B5125MD11
Compressor motor			-	2,4
<b>Refrigerant oil</b>			-	0,9 (M-MA68)
Carterheating			-	20 (carterheating)
Starting method			-	Direct
<b>Heat exchanger</b>			-	Air (straight fin)
Defrost control			Microprocessor controller de-icer	
<b>Refrigerant</b>			R410A	
<b>Refrigerant amount</b>			-	3,8 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve	
<b>Air handling equipment, fan type</b>			-	Axiaal ventilator x 1
Motor			-	120 x 1
<b>Air flow</b>			Min.1600	4500
<b>Air entrance temperature cooling min./ max.</b>			16 / 32	-
<b>Air entrance temperature heating min./ max.</b>			10 / 32	-
<b>Water entrance temperature cooling min./ max.</b>			16 / 32	-
<b>Water entrance temperature heating min./ max.</b>			10 / 32	-
<b>Safety equipment</b>			-	Internal thermostat for fanmotor, anomalous discharge temperature protection
<b>Refrigerant piping</b>			Liquid line 10mm, Gas line 16mm	
Piping size			Liquid line 9,52 mm (3/8"), Gas line 15,88mm (5/8")	
Connecting method			Flare piping	
Isolation			Necessary (liquid and gasline)	
<b>Drain hose</b>			-	Drain pan3x Ø20 mm
<b>Accessoires</b>			-	
Paneel (separate packing)			-	
<b>Optional accessoires</b>			-	-
Remote controller			RC-E3	-

### Notes

(1) The data are measured at the following conditions.

Mode	Item	Indoor temperature		Outdoor temperature		standard
		d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling		27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating		20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).

## Model FD-PAC / FDC125VS

Technical specifications		Model	Control kit	Outdoor unit
			FD-PAC	FDC125VS
<b>Nominal cooling capacity (1)</b>		W	12500 (5000 ~ 14000)	
<b>Nominal heating capacity (1)</b>		W	14000 (4000 ~ 16000)	
<b>Power source</b>			1 fase, 220/230/240V, 50Hz, N, PE	
<b>Operation data (3)</b>	Cooling power consumption	kW	4,10/4,10	
	Running current (cooling)	A	18,0/18,8	
	Power factor (cooling)	%	99/99	
	Heating power consumption	kW	3,65/3,65	
	Running current (heating)	A	16,0/16,8	
	Power factor (heating)	%	99/99	
	Inrush current	A	5,0	
	Moise level	dB(A)	-	50
<b>Exterior dimensions (height x width x depth)</b>		mm	400 x 300 x 120	845 x 970 x 370
<b>Nett weight</b>		Kg	8	74
<b>Compressor type</b>			-	RM-B5125MD11
Compressor motor		kW	-	2,5
<b>Refrigerant oil</b>		L	-	0,9 (M-MA68)
Carterheating		W	-	20 (carterheating)
Starting method			-	Direct
<b>Heat exchanger</b>			-	Air (straight fin)
Defrost control			Microprocessor controller de-icer	
<b>Refrigerant</b>			R410A	
<b>Refrigerant amount</b>		kg	-	3,8 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve	
<b>Air handling equipment, fan type</b>			-	Axiaal ventilator x 1
Motor			-	120 x 1
<b>Air flow</b>		m³/h	Min.2000	4500
<b>Air entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Air entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Water entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Water entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Safety equipment</b>			-	Internal thermostat for fanmotor, anomalous discharge temperature protection
<b>Refrigerant piping</b>		mm	Liquid line 10mm, Gas line 16mm	
Piping size		mm	Liquid line 9,52 mm (3/8"), Gas line 15,88mm (5/8")	
Connecting method			Flare piping	
Isolation			Necessary (liquid and gasline)	
<b>Drain hose</b>		mm	-	Drain pan3x Ø20 mm
<b>Accessoires</b>			-	
Paneel (separate packing)			-	
<b>Optional accessoires</b>			-	-
Remote controller			RC-E3	-

### Notes

(1) The data are measured at the following conditions.

Mode	Indoor temperature		Outdoor temperature		standard
	d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).



## Model FD-PAC / FDC140VS

Technical specifications		Model	Control kit	Outdoor unit
			FD0-PAC	FDC140VS
<b>Nominal cooling capacity (1)</b>		W	14000 (5000 ~ 14500)	
<b>Nominal heating capacity (1)</b>		W	16000 (4000 ~ 16500)	
<b>Power source</b>			1 fase, 220/230/240V, 50Hz, N, PE	
<b>Operation data (3)</b>	Cooling power consumption	kW	4,98/4,98	
	Running current (cooling)	A	22,0/23,0	
	Power factor (cooling)	%	98/98	
	Heating power consumption	kW	4,69/4,69	
	Running current (heating)	A	20,5/21,5	
	Power factor (heating)	%	99	
	Inrush current	A	5,0	
	Moise level	dB(A)	-	51
<b>Exterior dimensions (height x width x depth)</b>		mm	400 x 300 x 120	845 x 970 x 370
<b>Nett weight</b>		Kg	8	74
<b>Compressor type</b>			-	RM-B5125MD11
Compressor motor		kW	-	2,6
<b>Refrigerant oil</b>		L	-	0,9 (M-MA68)
Carterheating		W	-	20 (carterheating)
Starting method			-	Direct
<b>Heat exchanger</b>			-	Air (straight fin)
Defrost control			Microprocessor controller de-icer	
<b>Refrigerant</b>			R410A	
<b>Refrigerant amount</b>		kg	-	3,8 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve	
<b>Air handling equipment, fan type</b>			-	Axiaal ventilator x 1
Motor			-	120 x 1
<b>Air flow</b>		m³/h	Min.2000	4500
<b>Air entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Air entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Water entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Water entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Safety equipment</b>			-	Internal thermostat for fanmotor, anomalous discharge temperature protection
<b>Refrigerant piping</b>		mm	Liquid line 10mm, Gas line 16mm	
Piping size		mm	Liquid line 9,52 mm (3/8"), Gas line 15,88mm (5/8")	
Connecting method			Flare piping	
Isolation			Necessary (liquid and gasline)	
<b>Drain hose</b>		mm	-	Drain pan3x Ø20 mm
<b>Accessoires</b>			-	
Paneel (separate packing)			-	
<b>Optional accessoires</b>			-	-
Remote controller			RC-E3	-

### Notes

(1) The data are measured at the following conditions.

Mode	Item	Indoor temperature		Outdoor temperature		standard
		d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling		27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating		20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).

## Model FD-PAC / FDC200VS

Technical specifications		Model	Control kit	Outdoor unit
			FD-PAC	FDC200VS
<b>Nominal cooling capacity (1)</b>		W	20000 (7000 ~ 22400)	
<b>Nominal heating capacity (1)</b>		W	22400 (7600 ~ 25000)	
<b>Power source</b>			3 fase, 380/400/415V, 50Hz, N, PE	
<b>Operation data (3)</b>	Cooling power consumption	kW	6,47/6,47	
	Running current (cooling)	A	9,7/10,1	
	Power factor (cooling)	%	96/97	
	Heating power consumption	kW	5,97/5,97	
	Running current (heating)	A	9,1/9,5	
	Power factor (heating)	%	95/95	
	Inrush current	A	5,0	
	Moise level	dB(A)	-	57
<b>Exterior dimensions (height x width x depth)</b>		mm	400 x 300 x 120	1300 x 970 x 370
<b>Nett weight</b>		Kg	8	122
<b>Compressor type</b>			-	GT-C5150ND79
Compressor motor		kW	-	4,5
<b>Refrigerant oil</b>		L	-	1,45 (M-MA32R)
Carterheating		W	-	40 (carterheating)
Starting method			-	Direct
<b>Heat exchanger</b>			-	Air (straight fin)
Defrost control			Microprocessor controller de-icer	
<b>Refrigerant</b>			R410A	
<b>Refrigerant amount</b>		kg	-	5,4 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve	
<b>Air handling equipment, fan type</b>			-	Axiaal ventilator x 2
Motor			-	120 x 2
<b>Air flow</b>		m³/h	Min.3000	9000
<b>Air entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Air entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Water entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Water entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Safety equipment</b>			-	Internal thermostat for fanmotor, anomalous discharge temperature protection
<b>Refrigerant piping</b>		mm	Liquid line 10mm, Gas line 16mm	
Piping size		mm	Liquid line 9,52 mm (3/8"), Gas line 22,22mm (7/8")	
Connecting method			Flare piping	
Isolation			Necessary (liquid and gasline)	
<b>Drain hose</b>		mm	-	Drain pan3x Ø20 mm
<b>Accessoires</b>			-	
Paneel (separate packing)			-	
<b>Optional accessoires</b>			-	-
Remote controller			RC-E3	-

### Notes

(1) The data are measured at the following conditions.

Mode	Item	Indoor temperature		Outdoor temperature		standard
		d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling		27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating		20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).

## Model FD-PAC / FDC250VS

Technical specifications		Model	Control kit	Outdoor unit
			FD-PAC	FDC250VS
<b>Nominal cooling capacity (1)</b>		W	25000 (10000 ~ 28000)	
<b>Nominal heating capacity (1)</b>		W	28000 (9500 ~ 31500)	
<b>Power source</b>			3 fase, 380/400/415V, 50Hz, N, PE	
<b>Operation data (3)</b>	Cooling power consumption	kW	9,01/9,01	
	Running current (cooling)	A	13,5/14,1	
	Power factor (cooling)	%	96/97	
	Heating power consumption	kW	8,05/8,05	
	Running current (heating)	A	12,2/12,8	
	Power factor (heating)	%	95/96	
	Inrush current	A	5,0	
	Moise level	dB(A)	-	57
<b>Exterior dimensions (height x width x depth)</b>		mm	400 x 300 x 120	1505 x 970 x 370
<b>Nett weight</b>		Kg	8	140
<b>Compressor type</b>			-	GT-C5150ND79
Compressor motor		kW	-	4,8
<b>Refrigerant oil</b>		L	-	1,45 (M-MA32R)
Carterheating		W	-	40 (carterheating)
Starting method			-	Direct
<b>Heat exchanger</b>			-	Air (straight fin)
Defrost control			Microprocessor controller de-icer	
<b>Refrigerant</b>			R410A	
<b>Refrigerant amount</b>		kg	-	7,2 (pre-charged to 30 mtr)
Refrigerant expansion			Elektronic expansion valve	
<b>Air handling equipment, fan type</b>			-	Axiaal ventilator x 2
Motor			-	120 x 2
<b>Air flow</b>		m³/h	Min.4000	9000
<b>Air entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Air entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Water entrance temperature cooling min./ max.</b>		°C	16 / 32	-
<b>Water entrance temperature heating min./ max.</b>		°C	10 / 32	-
<b>Safety equipment</b>			-	Ingebouwde thermostaat voor ventilatormotor Beveiliging voor te hoge persgastemperatuur
<b>Refrigerant piping</b>		mm	Liquid line 10mm, Gas line 16mm	
Piping size		mm	Liquid line 12,7mm (1/2"), Gas line 22,22mm (7/8") (6)	
Connecting method			Flare piping	
Isolation			Necessary (liquid and gasline)	
<b>Drain hose</b>		mm	-	Drain pan3x Ø20 mm
<b>Accessoires</b>			-	
Paneel (separate packing)			-	
<b>Optional accessoires</b>			-	-
Remote controller			RC-E3	-

### Notes

(1) The data are measured at the following conditions.

Mode	Indoor temperature		Outdoor temperature		standard
	d.b. temp.	w.b. temp.	d.b. temp.	w.b. temp.	
Cooling	27°C	19°C	35°C	24°C	ISO-T1, JIS B8616
Heating	20°C	-	7°C	6°C	

(2) This airconditioner is manufactured and tested in conformity with the following standards: ISO-T1"unitary airconditioner".

(3) The operation data indicate when the airconditioner is operated at 230V, 50hz.

(4) Values in ( ~ ) show the minimum to maximum range.

(5) Adjustment of the estimated output via DIP switch (see page 16).

(6) See technical manual "branch pipe set" for correction on size.

## 3. Installation

### 3.1 SAFETY PRECAUTIONS

- Read the "SAFETY PRECAUTIONS" carefully first of all and then strictly follow it during the installation work in order to protect yourself. The precautionary items mentioned below are distinguished into two levels, WARNING and CAUTION.

WARNING: Wrong installation would cause serious consequences such as injuries or death.

CAUTION: Wrong installation might cause serious consequences depending on circumstances.

Both mention the important items to protect your health and safety so strictly follow them by any means.

- After completing the installation, do commissioning to confirm there are no abnormalities, and explain to the customers about

"SAFETY PRECAUTIONS", correct operation method and maintenance method (air filter cleaning, operation method and temperature setting method) with user's manual of this unit. Ask your customers to keep this installation manual together with the user's manual. Also, ask them to hand over the user's manual to the new user when the owner is changed.



### WARNING

- **Installation should be performed by the specialist.**  
If you install the unit by yourself, it may lead to serious trouble such as water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Install the system correctly according to these installation manuals.**  
Improper installation may cause explosion, injury, water leakage, electric shock, and fire.
- **Consider measurement not to exceed the limit of the density of refrigerant in the event of leakage especially when it is installed in a small room.**  
Consult the specialist about the measure. If the density of refrigerant exceeds the limit in the event of the leakage, serious accidents may occur due to lack of oxygen.
- **Use the genuine accessories and the specified parts for installation.**  
If parts unspecified by our company are used it could cause water leakage, electric shock, fire, and injury due to overturn of the unit.
- **Ventilate the working area well in case the refrigerant leaks during installation.**  
If the refrigerant contacts the fire, toxic gas is produced.
- **Install the unit in a location that can hold heavy weight.**  
Improper installation may cause the unit to fall leading to accidents.
- **Install the unit properly in order to be able to withstand strong winds such as typhoons, and earthquakes.**  
Improper installation may cause the unit to fall leading to accidents.
- **Do not mix air in to the cooling cycle on installation or removal of the air conditioner.**  
If air is mixed in, the pressure in the cooling cycle will rise abnormally and may cause explosion and injuries.
- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**  
Power source with insufficient capacity and improper work can cause electric shock and fire.
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**  
Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel properly.**  
Improper fitting may cause abnormal heat and fire.
- **Check for refrigerant gas leakage after installation is completed.**  
If the refrigerant gas leaks into the house and comes in contact with a fan heater, a stove, or an oven, toxic gas is produced.
- **Use the specified pipe, flare nut, and tools for R410A.**  
Using existing parts (R22) could cause the unit failure and serious accident due to explosion of the cooling cycle.
- **Tighten the flare nut according to the specified method by with torque wrench.**  
If the flare nut were tightened with excess torque, it could cause burst and refrigerant leakage after a long period.

- **Make sure there is no dust or clogging on both the plug and the socket nor loose connection of the socket before plugging, and plug in securely to the end of the blade.**  
Accumulation of dust, clogging on the socket or plug, or loose installation of the socket could cause electric shock and fire. Replace the socket if it is loose.
- **Connect the pipes for refrigeration circuit securely in installation work before compressor is operated.**  
If the compressor is operated when the service valve is open without connecting the pipe, it could cause explosion and injuries due to abnormal high pressure in the system.
- **Stop the compressor before removing the pipe on pump down work.**  
If the pipe is removed when the compressor is in operation with the service valve open, air would be mixed in the refrigeration circuit and it could cause explosion and injuries due to abnormal high pressure in the cooling cycle.
- **Use the genuine optional parts. And installation should be performed by a specialist.**  
If you install the unit by yourself, it could cause water leakage, electric shock and fire.
- **Do not repair by yourself. And consult with the dealer about repair.**  
Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air conditioner.**  
Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**  
If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Do not run the unit when the panel or protection guard are taken off.**  
Touching the rotating equipment, hot surface, or high voltage section could cause an injury to be caught in the machine, to get burned, or electric shock.
- **Shut off the power before electrical wiring work.**  
It could cause electric shock, unit failure and improper running.

## **CAUTION**

- Ground the equipment. Do not connect the ground wire to gas piping, water piping, a lightning rod, or telephone ground wires. If grounding is not performed correctly electric shock could occur.
- Depending on the installation location, a circuit breaker may need to be installed. If a circuit breaker is not installed, electric shock may occur.
- Please follow this manual faithfully in performing installation work. Improper installation work can cause abnormal vibrations and noise generation.
- Do not install the equipment in areas where there is danger of flammable gas leaks. If such gas does leak it could collect around the units and cause a fire.
- Install the drain piping in accordance with the installation manual so that it properly discharges waste water and is maintained at a temperature that prevents condensation.
- Do not install the outdoor unit where winds from its fan blow directly onto a plant, etc. Winds can affect adversely to the plant, etc.
- Secure a space for inspection and maintenance as specified in the manual. An insufficient space can result in an accident such as a fall from the installation point and a resultant personal injury.
- When the outdoor unit is installed on a roof or at an elevated point, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.
- In tightening a flare nut, use a double spanner and observe the specified tightening torque. Care must be taken so as not to overtighten a nut and damage the flare part. (Please refer to the tightening torque) The loosening or damage of the flare part can cause a refrigerant gas leak and a resultant lack-of-oxygen accident.
- Please dress the refrigerant piping with a heat insulation material for prevention of dew condensation. Improper heat insulation for prevention of dew condensation can cause the leaking or dripping of water and a resultant soaking of household effects.
- When refrigerant piping is completed, check its air-tightness with nitrogen gas to make sure it does not have a leak. A leak of refrigerant gas in a narrow room beyond the safety limit concentration can cause a lack-of oxygen accident.
- If the humidity exceeds 80% or the drain or piping become clogged, condensation from the indoor unit could drip and cause damage. Please do not install the indoor units above items of furniture, etc. that you do not want to get wet. Also, do not place items that you do not want to get wet underneath the indoor units.

## 3.2 Installation FD-PAC

All the required components for the FD-PAC in accordance with this delivery will be connected to the terminal on the FD-PAC.

The control kit can be switched on/off via an external 230V AC signal. Due to the invertercontrol of the outdoor unit it is recommended to control an external fan via the connections of the FD-PAC. See the attached wiring diagram (chapter 3.5). For further information regarding safety and protection systems please refer to the applicable MHI technical manual.

Connector CNT must be used in combination with optional equipment like the Cool-sign in. Damage can occur if incorrect power is applied.

1. The control box must be installed on an appropriate location close to the heat exchanger;
2. Installation piping outdoor unit-heat exchanger: Please refer to the applicable installation instructions/technical manual of the equipment;
3. Install filter/dryer (bi-flow) in the liquid line;
4. Install the electrical wiring in accordance with the wiring diagram. Please refer to the applicable installation instructions/technical manual of the equipment;
5. When using the control kit in combination with cold water equipment via plate heat exchangers there must be a minimum of 15% glycol in the system.
6. Positioning of the temperature sensors on the heat exchanger:

Thi-R1 – Install this sensor at approx. 80% after entrance (mode cooling) of heat exchanger.

Thi-R2 – Install this sensor at the entrance (mode cooling) of heat exchanger.

Thi-R3 – Install this sensor at the exit (mode cooling) of heat exchanger.

Thi-A – Install this sensor on an appropriate location in the return air or in the applicable room. A free flow of air is required must be guaranteed!

**Caution: Tighten the sensors sufficiently and apply insulation around the sensor! This to guarantee a correct temperature measurement and to prevent severe damage to the equipment!**

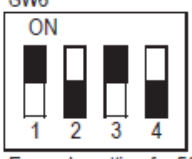
7. The estimated output needs to be adjusted via DIP switch SW6 of the PCB on the FD-PAC in accordance with this tabel:

Select the same capacity with the PCB removed from the unit.

SW6	-1	-2	-3	-4
40V	○	○	—	—
50V	○	—	○	—
60V	○	○	○	—
71V	○	—	—	○

SW6	-1	-2	-3	-4
100V	○	○	—	○
125V	—	—	○	○
140V	○	—	○	○

SW6	-1	-2	-3	-4
200V	—	○	○	○
250V	○	○	○	○

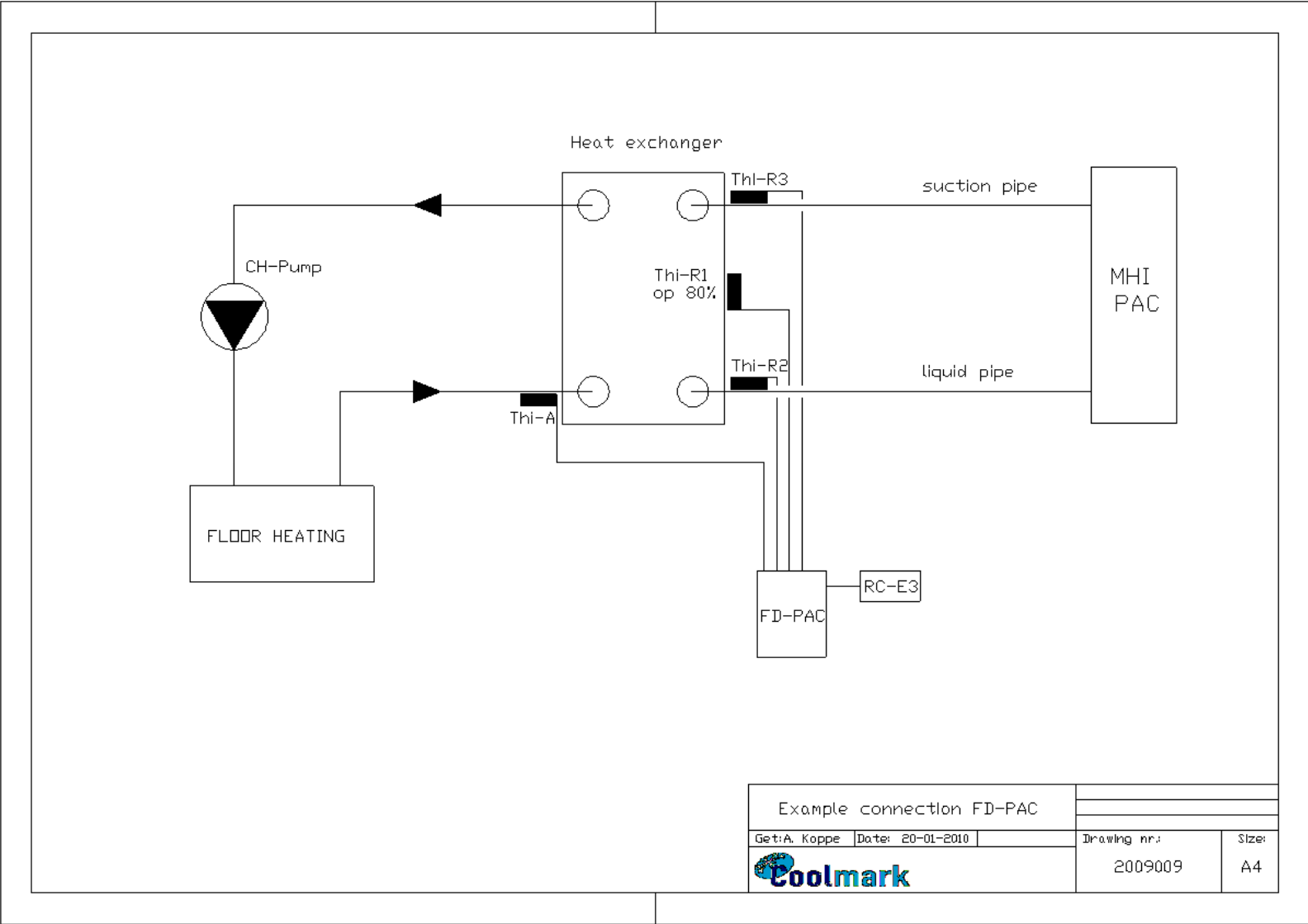


Example setting for 50V

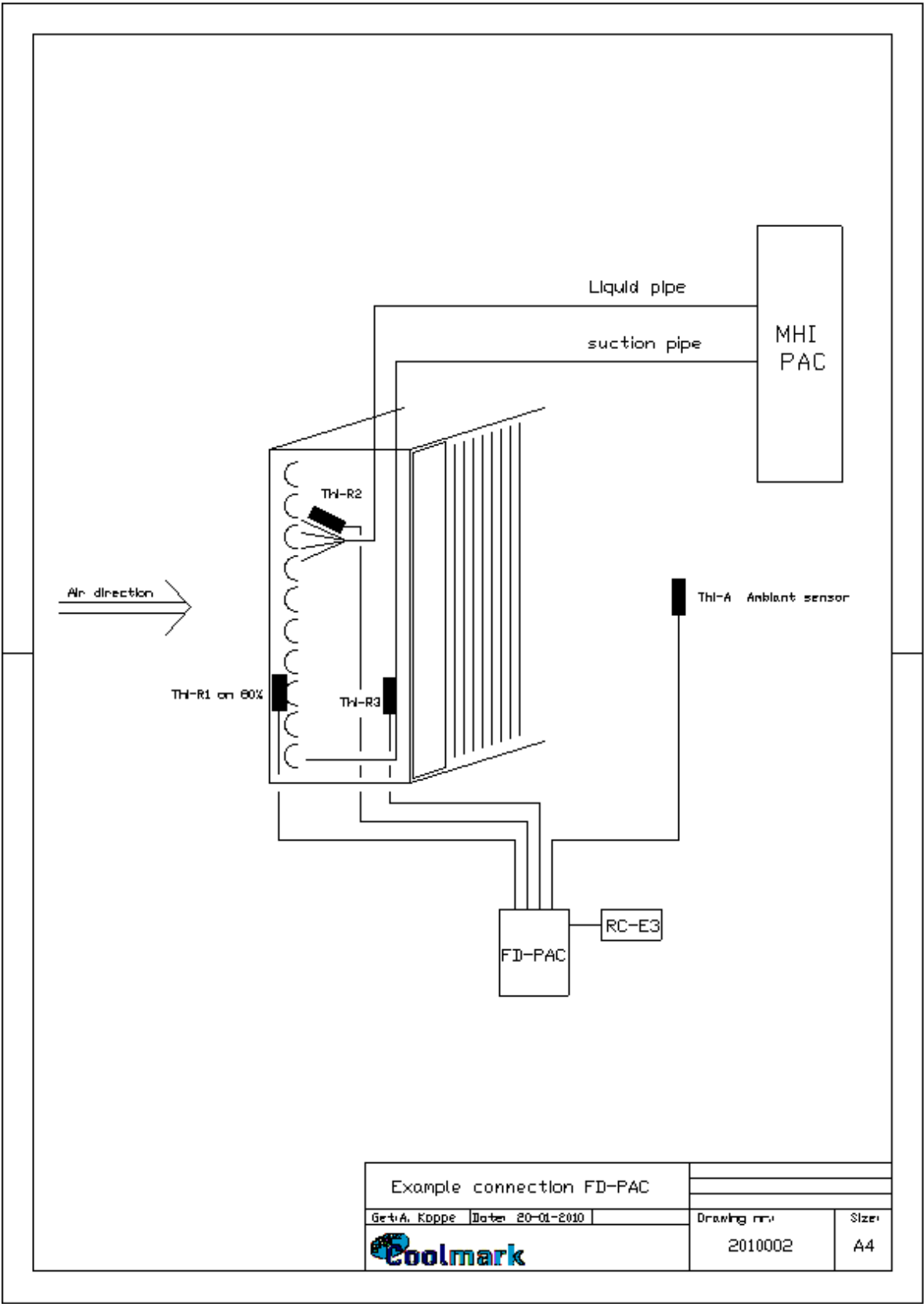
○:ON —:OFF

Caution: The commissioning needs to be performed in accordance with commissioning protocol regarding fluorized gas regulation and Kyoto protocol and local regulations.

### 3.3 Lay out plate heat exchanger

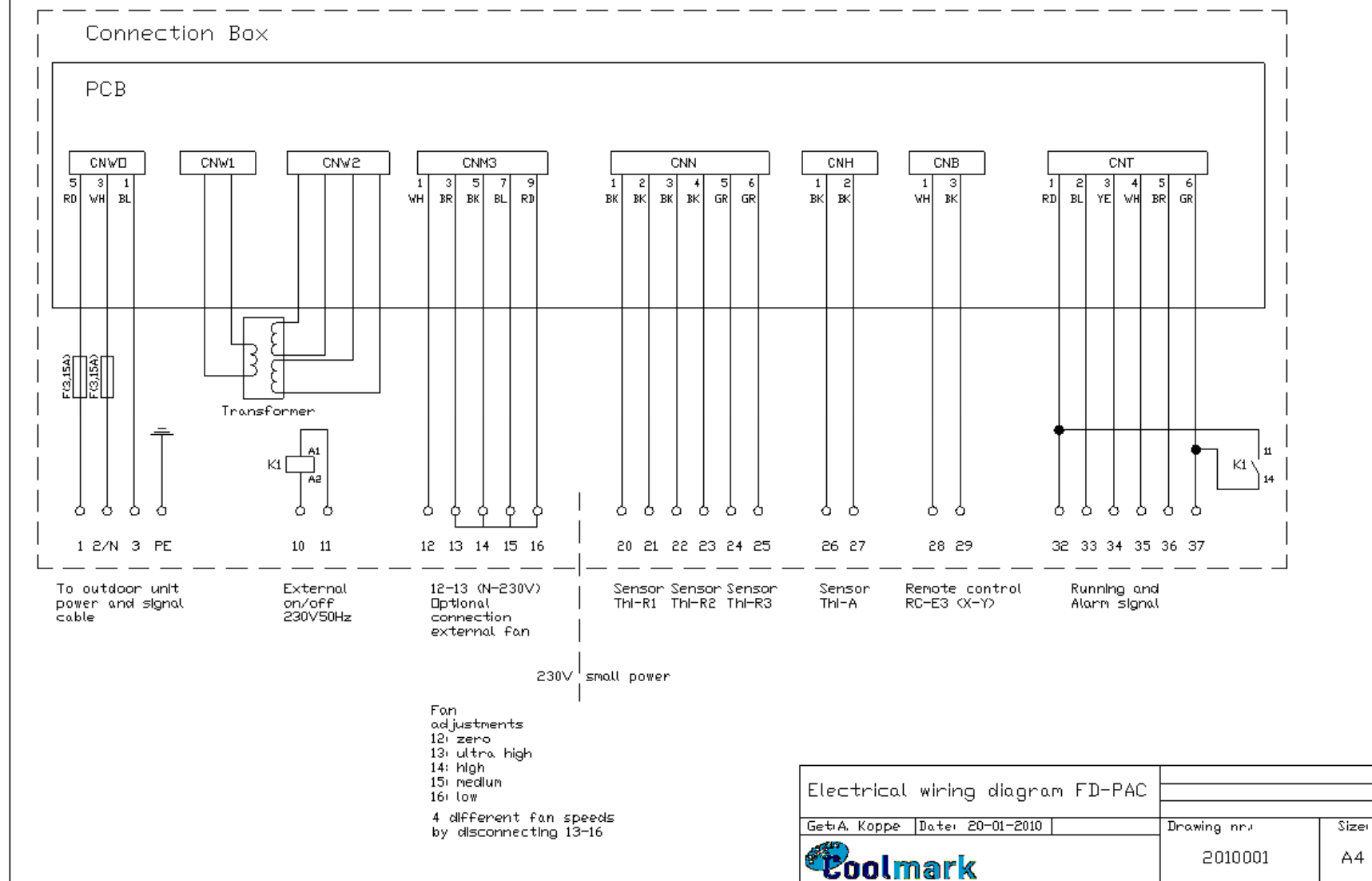


3.4 Lay out heat exchanger





### 3.4 Lay out wiring diagram



## 4. Troubleshooting

### ERROR CODES – R410A

Black = All R410A

Red = FD Split 1, 2 Series R410A

Blue = KX4 & KXR4 Series R410A

(does not cover SRK & SCM MODELS)

Technical Support  
Spares & Warranty  
01359 272211



Error Code	Indoor Circuit Board		Outdoor Circuit Board		Details of Fault
	Red LED	Green LED	Red LED	Green LED	

No indication	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	• Normal operation.
	Stays Off	Stays Off	Stays Off	Stays Off	• No mains power detected [power off or power failure]. • L phase wire is open circuit.
	Flashes 3 times	Keeps Flashing	Stays Off	Keeps Flashing	• Remote controller wires - X & Y connections are reversed. • Remote controller wires - Y & Z connections are reversed. • Remote controller wiring is open circuit. (X wire broken - a beep is produced and no indication is made. Z wire broken - no beep and no indication).

LCD Flashes continuously or Off	Stays Off	Keeps Flashing	Flashes Twice	Keeps Flashing	• Open Circuit or poor indoor/outdoor interconnecting wiring
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E1	Stays Off	Off or On continuously	Stays Off	Keeps Flashing	• Indoor circuit board or CPU failure.
	Off or On continuously	Off or On continuously	Stays Off	Keeps Flashing	• Indoor circuit board or CPU failure.
	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	• In group control, power supply to at least one indoor unit off • Remote controller wire Y is open circuit • Remote controller wires X and Y are reversed • Faulty Indoor or Remote controller PCB • Electrical noise interference
	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	• Remote controller wiring connected to A and B • A and B wiring connected in closed loop • Indoor unit PCB processor runs away
	Flashes 3 times	Keeps Flashing	Stays Off	Keeps Flashing	• Remote controller wiring open circuit



E2	Flashes once	Keeps Flashing	Stays Off	Keeps Flashing	<ul style="list-style-type: none"> <li>Duplication of indoor unit address.</li> <li>More than 49 indoor units are connected on a network.</li> </ul>
E3	Flashes Twice	Keeps Flashing	Stays Off	Stays Off	No mains power at outdoor unit [power off or power failure].
	Flashes Twice	Keeps Flashing	Stays Off	Keeps Flashing	Incorrect address setting of the outdoor unit
	Flashes Twice	Keeps Flashing	On or Stays Off	Undefined	No mains power at outdoor unit [power off or power failure].
E5	Flashes Twice	Keeps Flashing	Flashes Twice	Keeps Flashing	Outdoor/Indoor communication error
	Flashes Twice	Keeps Flashing	Stays Off	Stays Off	<ul style="list-style-type: none"> <li>Outdoor unit control PCB failure</li> <li>Inverter parts faulty</li> </ul>
	Flashes Twice	Keeps Flashing	Stays Off	Stays Off	<ul style="list-style-type: none"> <li>The outdoor power unit failure (where indoor/outdoor power supplies are separated)</li> <li>Indoor/outdoor communication error</li> <li>A and B wiring reversed after power on</li> </ul>
	Flashes twice	Keeps Flashing	Stays Off	Keeps Flashing or irregular	Outdoor unit microcomputer failure
E6	Flashes Once	Keeps Flashing	Stays Off	Keeps Flashing	<ul style="list-style-type: none"> <li>Indoor unit heat exchanger sensor [ThIR] defective (resistance is open circuit or closed circuit).</li> <li>Poor connection of sensor connector on the indoor PCB.</li> </ul>
E7	Flashes Once	Keeps Flashing	Stays Off	Keeps Flashing	<ul style="list-style-type: none"> <li>Indoor unit return sensor [ThIA] defective (resistance is open circuit or closed circuit).</li> <li>Poor connection of sensor connector on the indoor PCB.</li> </ul>
E8	Flashes Once	Keeps Flashing	Stays Off	Keeps Flashing	Overload in heating (extraordinarily high indoor heat exchanger temperature).
					Indoor unit heat exchanger sensor [ThIR] failure (resistance of sensor is closed circuit).
E9	Flashes Once	Keeps Flashing	Stays Off	Keeps Flashing	Drain motor [DM] failure (drain motor open circuit or the drain motor is disconnected from the indoor PCB).
					<ul style="list-style-type: none"> <li>Condensate still detected in drain tray (the drain motor can not remove the condensate – blockage in discharge pipe or condensate returning to drain tray).</li> <li>Float switch stuck in high position.</li> <li>Defective float switch input circuit on indoor PCB.</li> <li>Defective drain motor output circuit on indoor PCB.</li> </ul>
E10	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	17 or more indoor units are connected to one remote controller (maximum permitted: 16 indoor units)
E11	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	More than one indoor unit is connected to a remote controller while trying to address the unit from the remote controller.



Mitsubishi Heavy Industries Air Conditioning Error Codes – R410A Systems

E12	Flashes once	Keeps Flashing	Stays Off	Keeps Flashing	<ul style="list-style-type: none"> <li>One or more units (indoor or outdoor) are still addressed at 48 or 49 [factory setting]</li> <li>While trying to auto address, one or more of the units (either indoor or outdoor) is not set at 49.</li> <li>Auto address is not possible on the system you are commissioning (Auto address is only possible on a single KX2 system).</li> </ul>
E14	Flashes 3 times	Keeps Flashing	Stays off	Keeps Flashing	<ul style="list-style-type: none"> <li>Incorrect setting of SW5 on indoor unit PCB when setting up a master / slave system.</li> <li>Incorrect control wiring between master and slave(s) [XYZ].</li> <li>Open circuit of control wiring between master and slave(s).</li> </ul>
E16	Stays off	Keeps Flashing	Stays off	Keeps Flashing	Faulty indoor fan motor
	Flashes once	Keeps Flashing	Stays off	Keeps Flashing	Faulty indoor fan motor
E28	Stays Off	Keeps Flashing	Stays Off	Keeps Flashing	Failure of the sensor within the remote controller.
E30	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	Indoor/outdoor unit connected error.
E31	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Duplication of an indoor unit address number (U00 – U47).</li> <li>Outdoor unit address setting error</li> </ul>
E32	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>The anti phase device has detected that two phases of the mains power need to be swapped.</li> <li>The [L2] phase of the mains power (primary side of contactor) has been detected as open phase.</li> </ul>
E34	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Abnormally low current (or no current) detected by [CT] on L3.</li> <li>Open phase detected at L3 (secondary side of contactor).</li> </ul>
E35	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Outdoor unit heat exchanger sensor [ThOR] defective (resistance is open circuit or closed circuit).</li> <li>Poor connection of sensor connector on the outdoor unit PCB.</li> </ul>
	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	Cooling high pressure
E36	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>The discharge temperature is abnormally high.</li> <li>Insufficient refrigerant.</li> <li>Compressor discharge temperature sensor [ThOD] defective.</li> </ul>



E37	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Outdoor unit heat exchanger sensor [ThOR] defective (resistance is open circuit).</li> <li>Poor connection of sensor connection on outdoor unit PCB.</li> </ul>	
	Stays Off	Keeps Flashing	One time Flash	Keeps Flashing	E37-1	Outdoor heat exch thermistor failure (Tho-R1)
			Two time Flash		E37-2	Outdoor heat exch thermistor failure (Tho-R2)
			Three time Flash		E37-3	Outdoor heat exch thermistor failure (Tho-R3)
			Four time Flash		E37-4	Outdoor heat exch thermistor failure (Tho-R4)
			Five time Flash		E37-5	Outdoor heat exch thermistor failure (Tho-SC)
			Six time Flash		E37-6	Outdoor heat exch thermistor failure (Tho-H)
E38	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Outside air temperature sensor [ThoA] defective (resistance is open circuit).</li> <li>Poor connection of sensor connection on outdoor unit PCB.</li> </ul>	
E39	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>Compressor discharge temperature sensor [ThOD] defective (resistance is open circuit).</li> <li>Poor connection of sensor connection on outdoor unit PCB.</li> </ul>	
E40	Stays Off	Keeps Flashing	Flashes Once	Keeps Flashing	<ul style="list-style-type: none"> <li>The high-pressure switch [63H or 63H1] has tripped.</li> <li>System overcharged with refrigerant.</li> <li>One (or more) of the service valves is shut.</li> <li>Insufficient airflow (or no airflow) over the condensercoil.</li> </ul>	
E41	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>The power transistor for the inverter has overheated.</li> </ul>	
E42	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Abnormally high current detected in compressor.</li> </ul>	
E43	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>The maximum number of indoor units connected to one outdoor unit has been exceeded.</li> </ul>	
E45	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Transmission error between inverter and outdoor unit PCB.</li> <li>Loose connection of [Cn]</li> </ul>	



Mitsubishi Heavy Industries Air Conditioning Error Codes – R410A Systems

E46	Stays Off	Keeps Flashing	Off	Keeps Flashing	<ul style="list-style-type: none"> <li>There is a conflict of address settings.</li> <li>A combination of: automatic / manual / remote control addresses coexist on one network.</li> </ul>
E47	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Inverter over voltage</li> </ul>
E48	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>DC Outdoor Fan motor fault</li> </ul>
E49	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Low pressure fault</li> </ul>
	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Low voltage detected</li> </ul>
E51	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Inverter PCB fault</li> </ul>
	Stays Off	Keeps Flashing	Flashes once or twice	Keeps Flashing	<ul style="list-style-type: none"> <li>Power transistor overheat</li> </ul>
E53	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Suction pipe thermistor (Tho-S) disconnected</li> </ul>
E54	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Low pressure sensor (PSL) disconnected/output error</li> </ul>
	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>E54-1 Low pressure sensor (PSL) disconnection/output error</li> </ul>
			Flashes twice		<ul style="list-style-type: none"> <li>E54-2 High pressure sensor (PSH) disconnection/output error</li> </ul>
E55	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Compressor under dome thermistor disconnected</li> </ul>
E56	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Power transistor thermistor faulty or disconnected (FDCVA151-251)</li> </ul>
E57	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Refrigerant leak or shortage of refrigerant (FDCVA151-251)</li> </ul>
E59	Stays Off	Keeps Flashing	1 to 5 times flash	Keeps Flashing	<ul style="list-style-type: none"> <li>Compressor start-up error</li> </ul>
E60	Stays Off	Keeps Flashing	Flashes once or twice	Keeps Flashing	<ul style="list-style-type: none"> <li>Compressor position detection error</li> </ul>
E63	Stays Off	Keeps Flashing	Flashes once	Keeps Flashing	<ul style="list-style-type: none"> <li>Emergency stop of indoor unit</li> </ul>



Mitsubishi Heavy Industries Air Conditioning Error Codes – R410A Systems